Summary of Fall 1987 Juvenile Coho Sampling on the Lachmach River, British Columbia

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by

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ABSTRACT

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Juvenile coho salmon (*Onchorhychus kisutch*) were sampled in the Lachmach River, British Columbia, between October 6 and November 12, 1987. All juvenile coho captured were measured and subsamples of weights were collected. This report contains the sampling and marking data and sampling summaries.

RÉSUMÉ

Finnegan, B. 2001. Summary of fall 1987 juvenile coho sampling on the Lachmach River, British Columbia. Can. Data Rep. Fish. Aquat. Sci. 1079: 47 p

De jeunes saumons cohos (*Onchorhychus kisutch*) ont été prélevés dans la rivière Lachmach (Colombie-Britannique), entre le 6 octobre et le 12 novembre 1987. Tous les jeunes saumons cohos capturés ont été mesurés et des sous-échantillons de poids ont été recueillis. Le présent rapport présente les données d'échantillonnage et de marquage ansi que les résumés d'échantillonnage.

INTRODUCTION

The Lachmach River project is part of the Coho Salmon Research Program which was initiated in response to the Canada-U.S. Pacific Salmon Treaty. This program obtains information on the biology and productivity of coho salmon (*Oncorhynchus kisutch*) stocks in British Columbia. The Lachmach River Project was set up in the spring of 1987 to obtain information on coho salmon stocks in northern British Columbia.

The Lachmach River is located 23 km east of Prince Rupert, B. C., at the head of Work Channel (Fig. 1). It is a small coastal type stream approximately 8 km in length. It drains a small (41.3 km^2) catchment bordered by steep mountains. Clearcut logging occurred on the western slope of the catchment in the late 1970's and early 1980's. Populations of coho salmon (*Oncorhynchus kisutch*), pink salmon (*O. gorbuscha*), chum salmon (*O. keta*), steelhead trout (*O. mykiss*), cutthroat trout (*O. clarki*), Dolly Varden char (*Salvelinus malma*), threespine stickleback (*Gasterosteus aculeatus*), prickly sculpin (*Cottus asper*), and coastrange sculpin (*C. aleuticus*).

This report presents juvenile coho data from sampling conducted in the fall of 1987.

METHODS

A survey of the Lachmach River was conducted in July 1987 to determine stream gradient and identify habitat types along the stream length (R. L. Dunbrack unpubl. data). This survey commenced at the fence site which is located approximately 20 meters downstream of the tidal boundary. Distances were measured using a standard surveyors chain. Stream gradient was determined using a builders level and levelling rod. The stream was flagged every 10 meters using flagging tape. Locations of all features such as falls and tributaries were recorded.

Fish sampling sites were selected from throughout the surveyed area. The sites selected and sampled in 1987 included:

1. 393
2. 570
3. 2000
4. 3390
5. 3820
6. 5000
7. 7000
8. 8000

These numbers represent the sites location in meters upstream of the counting fence site (Fig. 2).

A variety of fish capture techniques were used in 1987. Sites 393, 570 and 2000 were sampled using a hand held pole seine (Conlin and Tutty1979). Site 3390 was sampled using a pole seine and 6 Gee minnow traps (Cuba Specialty Manufacturing Ltd., NY) baited with salted salmon roe. For the recapture sampling at 3390, 45 Gee minnow traps were used. Sites 3820, 5000, 7000 and 8000 were sampled using 40 to 45 Gee minnow traps baited with salted salmon roe.

Sampling at 393, 570 and 2000 using a pole seine involved making multiple sweeps along the site margins and through the middle of the site. Each site was swept upstream and downstream. Fish captured from these sweeps were combined and sampled as one pass. A second pass was conducted using an identical number of sweeps, again both upstream and downstream. The exception to this was 2000 where the second pass was not conducted due to a grizzly bear occupying the upstream end of the site.

Sampling at site 3390 involved using a pole seine combined with Gee improved minnow traps to capture fish for marking. This site proved to be difficult to sample with a pole seine due to its width and depth. For the recapture of marked fish only Gee minnow traps were used.

The capture techniques were refined beginning with site 3820. All sites where Gee minnow traps are used are open, no barrier nets are used to prevent fish movement from the site. The sampling at 3820 was designed to determine the amount of coho movement within the site between marking and recapture. During the initial capture operation Gee traps were set out in 15 lines of three traps, one trap near each bank and one trap mid stream (figure 5). The traps near the stream banks were set from shore, the mid stream trap was tossed from shore. Traps were marked with styrofoam floats. All coho captured were anaesthetised counted as being large or small based on length and marked with a caudal fin clip.

Following marking the marked fish were released throughout a 100 meter area in the centre of the sample site (figure 5). The following day traps were reset in 15 lines throughout the site. Sampling was conducted by line to determine the distribution of marked fish within the site.

At site 5000 the mark and recapture technique was further refined. After setting out the site the traps were again laid out in lines. Marking and sampling was conducted following the site 3820 procedures. However, due to concerns about low recapture rates on the day following marking, recapture was delayed for 3 days. This procedure was followed at 7000 and 8000.

Catch sampling was conducted as follows. All fish captured were anaesthetized using 2-phenoxyethanol, identified to species and measured to the nearest millimeter. A subsample of weights from coho was also collected. All salmonids and Dolly Varden char were fin clipped at sites where mark and recapture estimates were being conducted. At site 393 a cold brand mark was used. The mark was applied using a 3mm V shaped silver brand. The brand was mounted at the end of 15 cm long 5 mm wide copper bar. The brand was cooled in a dry ice acetone solution. The brand was applied to right dorsal side of each fish. At sites where removal

estimates were made the fish from each pass were sampled separately. All fish captured were allowed to fully recover before being released back into the site.

Population estimates for sites 570 and 3390 were determined using the 2 pass removal technique (Seber and LeCren, 1967). Population estimates for 3820, 5000, 7000, 8000 and an additional estimate at 3390 were determined using a modified Peterson mark and recapture (Ricker, 1975).

Wetted area of the sample sites was detemined using a 100 meter fibreglass measuring tape. No other habitat characteristics were measured during this survey.

RESULTS

Table 1 shows the sampling dates, locations, biological data, marks applied and comments associated with the juvenile coho sampling conducted between October 6 and November 12, 1987. Table 2 gives a summary of this sampling.

Table 3 gives a summary of the population estimates calculated for each sample site. Table 3 also shows the site wetted areas and subsequent densities of juvenile of coho in fish/m^2. The highest density of age 0+ and 1+ coho were found at the 3820 site (2.85, 2.17). The lowest density of age 0+ coho was found in the 5000 site (0.08). The lowest density of age 1+ coho was found at site 570(0.01).

Table 4 is a summary of the capture technique, data and the population estimation method used for each site. Table 5 is a summary of marks caught by trap location at site 3820. The majority of marks were recovered near the centre of the release with no marked fish recovered at the upstream and downstream boundaries. Figure 1 shows the general area of the Lachmach River. Figure 2 is a map of the Lachmach River showing the location of sample sites. Figure 3 shows length frequencies of juvenile sampled at all sites. Figure 5 shows the arrangement of traps and the release and capture areas at site 3820.

REFERENCES

Conlin, K. and B. D. Tutty. 1979. Juvenile salmonid field trapping manual. Fisheries and Marine Service MS Rep. 1530: 135 p.

Ricker, W. E. 1975. Computation and interpretation of biological statistics of fish populations. Fish. Res. Bd. Can. Bull. 191. 382 p.

Seber, G. A. F. and E. D. LeCren. 1967. Estimating population parameters from catches large relative to the population. J. Anim. Ecol. 46: 631 - 643.

Table 1. Lachmach River juvenile coho sampling fall 1987.

Date	Site	Length (mm)	Weight (g)	Mark	Comment
06-Oct-87	393	50	1.30	v brand	
06-Oct-87	393	56	1.35	v brand	
06-Oct-87	393	58	2.10	v brand	
06-Oct-87	393	58	2.05	v brand	
06-Oct-87	393	78	4.70	v brand	
06-Oct-87	570	52	1.35	not marked	pass 1
06-Oct-87	570	53	1.45	not marked	pass 1
06-Oct-87	570	60	2.00	not marked	pass 1
06-Oct-87	570	62	2.25	not marked	pass 1
06-Oct-87	570	62	2.40	not marked	pass 1
06-Oct-87	570	65	2.70	not marked	pass 1
06-Oct-87	570	66	2.90	not marked	pass 1
06-Oct-87	570	67	2.65	not marked	pass 1
06-Oct-87	570	69	3.35	not marked	pass 1
06-Oct-87	570	70	3.35	not marked	pass 1
06-Oct-87	570	71	3.35	not marked	pass 1
06-Oct-87	570	75	4.55	not marked	pass 1
06-Oct-87	570	77	4.65	not marked	pass 1
06-Oct-87	570	50	1.05	not marked	pass 2
06-Oct-87	570	55	1.55	not marked	pass 2
06-Oct-87	570	56	1.70	not marked	pass 2
06-Oct-87	570	50	1.35	not marked	pass 2
06-Oct-87	570	56	1.80	not marked	pass 2
06-Oct-87	570	63	2.45	not marked	pass 2
07-Oct-87	2000	51	1.25	not marked	no est due to bear
07-Oct-87	2000	52	1.45	not marked	no est due to bear
07-Oct-87	2000	53	1.40	not marked	no est due to bear
07-Oct-87	2000	54	1.40	not marked	no est due to bear
07-Oct-87	2000	60	2.10	not marked	no est due to bear
07-Oct-87	2000	62	2.40	not marked	no est due to bear
07-Oct-87	2000	63	2.65	not marked	no est due to bear
07-Oct-87	2000	77	4.20	not marked	no est due to bear
07-Oct-87	2000	84	5.95	not marked	no est due to bear
08-Oct-87	3390	45	1.00	rv	pass 1
08-Oct-87	3390	48	1.05	rv	pass 1
08-Oct-87	3390	48	1.05	rv	pass 1
08-Oct-87	3390	48		rv	pass 1
08-Oct-87	3390	48		rv	pass 1
08-Oct-87	3390	48		rv	pass 1
08-Oct-87	3390	48		rv	pass 1

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
08-Oct-87	3390	48		rv	pass 1
08-Oct-87	3390	49	1.10	rv	pass 1
08-Oct-87	3390	49	1.20	rv	pass 1
08-Oct-87	3390	49		rv	pass 1
08-Oct-87	3390	50	1.20	rv	pass 1
08-Oct-87	3390	51	1.35	rv	pass 1
08-Oct-87	3390	51	1.40	rv	pass 1
08-Oct-87	3390	51		rv	pass 1
08-Oct-87	3390	52	1.20	rv	pass 1
08-Oct-87	3390	52	1.30	rv	pass 1
08-Oct-87	3390	53	1.65	rv	pass 1
08-Oct-87	3390	53	1.40	rv	pass 1
08-Oct-87	3390	53		rv	pass 1
08-Oct-87	3390	53		rv	pass 1
08-Oct-87	3390	55	1.55	rv	pass 1
08-Oct-87	3390	55	1.50	rv	pass 1
08-Oct-87	3390	58	1.90	rv	pass 1
08-Oct-87	3390	60	1.40	rv	pass 1
08-Oct-87	3390	60	2.20	rv	pass 1
08-Oct-87	3390	65	2.50	rv	pass 1
08-Oct-87	3390	65	2.65	rv	pass 1
08-Oct-87	3390	66		rv	pass 1
08-Oct-87	3390	67	2.90	rv	pass 1
08-Oct-87	3390	68	3.10	rv	pass 1
08-Oct-87	3390	72	3.90	lv	pass 1
08-Oct-87	3390	73	4.05	lv	pass 1
08-Oct-87	3390	79	5.35	lv	pass 1
08-Oct-87	3390	82	5.70	lv	pass 1
08-Oct-87	3390	84	5.85	lv	pass 1
08-Oct-87	3390	42		rv	pass 2
08-Oct-87	3390	47		rv	pass 2
08-Oct-87	3390	51		rv	pass 2
08-Oct-87	3390	51		rv	pass 2
08-Oct-87	3390	52		rv	pass 2
08-Oct-87	3390	53		rv	pass 2
08-Oct-87	3390	53		rv	pass 2
08-Oct-87	3390	54		rv	pass 2
08-Oct-87	3390	54		rv	pass 2
08-Oct-87	3390	56		rv	pass 2
08-Oct-87	3390	57		rv	pass 2

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
08-Oct-87	3390	58		rv	pass 2
08-Oct-87	3390	59		rv	pass 2
08-Oct-87	3390	59		rv	pass 2
08-Oct-87	3390	59		rv	pass 2
08-Oct-87	3390	67		rv	pass 2
08-Oct-87	3390	70		rv	pass 2
08-Oct-87	3390	71		lv	pass 2
08-Oct-87	3390	87		lv	pass 2
09-Oct-87	3390	43		rv	mark run
09-Oct-87	3390	44		rv	
09-Oct-87	3390	44		rv	
09-Oct-87	3390	44		rv	
09-Oct-87	3390	44		rv	
09-Oct-87	3390	45		rv	
09-Oct-87	3390	45		rv	
09-Oct-87	3390	45		rv	
09-Oct-87	3390	45		rv	
09-Oct-87	3390	45		rv	
09-Oct-87	3390	45		rv	
09-Oct-87	3390	45		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	46		rv	
09-Oct-87	3390	47		rv	
09-Oct-87	3390	47		rv	
09-Oct-87	3390	47		rv	
09-Oct-87	3390	47		rv	
09-Oct-87	3390	47		rv	
09-Oct-87	3390	47		rv	
09-Oct-87	3390	47		rv	
09-Oct-87	3390	47		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
09-Oct-87	3390	48		rv	
09-Oct-87	3390	48		rv	
09-Oct-87	3390	48		rv	
09-Oct-87	3390	48		rv	
09-Oct-87	3390	48		rv	
09-Oct-87	3390	48		rv	
09-Oct-87	3390	49		rv	
09-Oct-87	3390	49		rv	
09-Oct-87	3390	49		rv	
09-Oct-87	3390	49		rv	
09-Oct-87	3390	49		rv	
09-Oct-87	3390	49		rv	
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09-Oct-87	3390	50		rv	
09-Oct-87	3390	50		rv	
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09-Oct-87	3390	51		rv	
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09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
09-Oct-87	3390	51		rv	
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09-Oct-87	3390	53		rv	
09-Oct-87	3390	53		rv	
09-Oct-87	3390	53		rv	
09-Oct-87	3390	53		rv	
09-Oct-87	3390	53		rv	
09-Oct-87	3390	53		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
09-Oct-87	3390	53		rv	
09-Oct-87	3390	54		rv	
09-Oct-87	3390	54		rv	
09-Oct-87	3390	54		rv	
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09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	56		rv	
09-Oct-87	3390	57		rv	
09-Oct-87	3390	57		rv	
09-Oct-87	3390	57		rv	
09-Oct-87	3390	57		rv	
09-Oct-87	3390	58		rv	
09-Oct-87	3390	58		rv	
09-Oct-87	3390	58		rv	
09-Oct-87	3390	58		rv	
09-Oct-87	3390	58		rv	
09-Oct-87	3390	58		rv	
09-Oct-87	3390	59		rv	
09-Oct-87	3390	59		rv	
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09-Oct-87	3390	60		rv	
09-Oct-87	3390	60		rv	
09-Oct-87	3390	60		rv	
09-Oct-87	3390	60		rv	
09-Oct-87	3390	61		rv	
09-Oct-87	3390	61		rv	
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09-Oct-87	3390	61		rv	
09-Oct-87	3390	62		rv	
09-Oct-87	3390	62		rv	
09-Oct-87	3390	62		rv	
09-Oct-87	3390	62		rv	
09-Oct-87	3390	64		rv	
09-Oct-87	3390	64		rv	
09-Oct-87	3390	64		rv	
09-Oct-87	3390	64		rv	
09-Oct-87	3390	65		rv	
09-Oct-87	3390	65		rv	
09-Oct-87	3390	65		rv	
09-Oct-87	3390	65		rv	
09-Oct-87	3390	65		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
09-Oct-87	3390	65		rv	
09-Oct-87	3390	65		rv	
09-Oct-87	3390	65		rv	
09-Oct-87	3390	66		rv	
09-Oct-87	3390	66		rv	
09-Oct-87	3390	67		rv	
09-Oct-87	3390	67		rv	
09-Oct-87	3390	67		rv	
09-Oct-87	3390	67		rv	
09-Oct-87	3390	67		rv	
09-Oct-87	3390	68		rv	
09-Oct-87	3390	68		rv	
09-Oct-87	3390	68		rv	
09-Oct-87	3390	68		rv	
09-Oct-87	3390	68		rv	
09-Oct-87	3390	69		rv	
09-Oct-87	3390	69		rv	
09-Oct-87	3390	70		rv	
09-Oct-87	3390	70		rv	
09-Oct-87	3390	70		rv	
09-Oct-87	3390	70		rv	
09-Oct-87	3390	70		rv	
09-Oct-87	3390	70		rv	
09-Oct-87	3390	71		lv	
09-Oct-87	3390	71		lv	
09-Oct-87	3390	72		lv	
09-Oct-87	3390	73		lv	
09-Oct-87	3390	73		lv	
09-Oct-87	3390	74		lv	
09-Oct-87	3390	74		lv	
09-Oct-87	3390	75		lv	
09-Oct-87	3390	75		lv	
09-Oct-87	3390	75		lv	
09-Oct-87	3390	75		lv	
09-Oct-87	3390	75		lv	
09-Oct-87	3390	75		lv	
09-Oct-87	3390	76		lv	
09-Oct-87	3390	76		lv	
09-Oct-87	3390	77		lv	
09-Oct-87	3390	77		lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
09-Oct-87	3390	77		lv	
09-Oct-87	3390	79		lv	
09-Oct-87	3390	79		lv	
09-Oct-87	3390	80		lv	
09-Oct-87	3390	80		lv	
09-Oct-87	3390	80		lv	
09-Oct-87	3390	80		lv	
09-Oct-87	3390	82		lv	
09-Oct-87	3390	82		lv	
09-Oct-87	3390	84		lv	
09-Oct-87	3390	85		lv	
09-Oct-87	3390	85		lv	
09-Oct-87	3390	85		lv	
09-Oct-87	3390	86		lv	
09-Oct-87	3390	86		lv	
09-Oct-87	3390	86		lv	
09-Oct-87	3390	87		lv	
09-Oct-87	3390	87		lv	
09-Oct-87	3390	87		lv	
09-Oct-87	3390	89		lv	
09-Oct-87	3390	89		lv	
09-Oct-87	3390	90		lv	
09-Oct-87	3390	91		lv	
09-Oct-87	3390	93		lv	
09-Oct-87	3390	93		lv	
09-Oct-87	3390	95		lv	
28-Oct-87	5000	50	1.10	lv	mark run
28-Oct-87	5000	54	1.50	lv	
28-Oct-87	5000	57	1.75	lv	
28-Oct-87	5000	58	1.70	lv	
28-Oct-87	5000	59	1.80	lv	
28-Oct-87	5000	62	2.20	lv	
28-Oct-87	5000	63	2.45	lv	
28-Oct-87	5000	64	2.50	lv	
28-Oct-87	5000	65	2.45	lv	
28-Oct-87	5000	65	2.60	lv	
28-Oct-87	5000	66	2.75	lv	
28-Oct-87	5000	66	2.55	lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	67	2.75	lv	
28-Oct-87	5000	67	2.60	lv	
28-Oct-87	5000	67		lv	
28-Oct-87	5000	67		lv	
28-Oct-87	5000	68	2.95	lv	
28-Oct-87	5000	68	3.05	lv	
28-Oct-87	5000	69	3.35	lv	
28-Oct-87	5000	70	3.15	lv	
28-Oct-87	5000	71	3.20	rv	
28-Oct-87	5000	71	3.45	rv	
28-Oct-87	5000	71		rv	
28-Oct-87	5000	72	3.40	rv	
28-Oct-87	5000	72		rv	
28-Oct-87	5000	73	3.50	rv	
28-Oct-87	5000	73	3.65	rv	
28-Oct-87	5000	73		rv	
28-Oct-87	5000	73		rv	
28-Oct-87	5000	74	3.80	rv	
28-Oct-87	5000	74	4.15	rv	
28-Oct-87	5000	75	4.25	rv	
28-Oct-87	5000	75	4.05	rv	
28-Oct-87	5000	75		rv	
28-Oct-87	5000	75		rv	
28-Oct-87	5000	76	4.00	rv	
28-Oct-87	5000	76	4.05	rv	
28-Oct-87	5000	76		rv	
28-Oct-87	5000	77	4.80	rv	
28-Oct-87	5000	77	4.50	rv	
28-Oct-87	5000	79	4.60	rv	
28-Oct-87	5000	80	4.90	rv	
28-Oct-87	5000	84		rv	
28-Oct-87	5000	88	6.90	rv	
28-Oct-87	5000	90	7.05	rv	
28-Oct-87	5000	92	7.50	rv	
28-Oct-87	5000	92	7.05	rv	
28-Oct-87	5000	93	7.95	rv	
28-Oct-87	5000	96	8.30	rv	
28-Oct-87	5000	97	9.45	rv	
28-Oct-87	5000	97	8.60	rv	
28-Oct-87	5000	97		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	97		rv	
28-Oct-87	5000	99	10.30	rv	
28-Oct-87	5000	100	10.20	rv	
28-Oct-87	5000	100	9.75	rv	
28-Oct-87	5000	101	11.40	rv	
28-Oct-87	5000	101	10.65	rv	
28-Oct-87	5000	101		rv	
28-Oct-87	5000	104	11.55	rv	
28-Oct-87	5000	105	11.45	rv	
28-Oct-87	5000	105	11.65	rv	
28-Oct-87	5000	106	12.10	rv	
28-Oct-87	5000	107	12.25	rv	
28-Oct-87	5000	107	11.65	rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	108	12.70	rv	
28-Oct-87	5000	110	12.70	rv	
28-Oct-87	5000	110	13.80	rv	
28-Oct-87	5000	110		rv	
28-Oct-87	5000	111	12.75	rv	
28-Oct-87	5000	111	10.55	rv	
28-Oct-87	5000	113	15.25	rv	
28-Oct-87	5000	113	15.20	rv	
28-Oct-87	5000	113		rv	
28-Oct-87	5000	128	20.00	rv	
28-Oct-87	5000	46	0.85	lv	
28-Oct-87	5000	46	0.85	lv	
28-Oct-87	5000	53	1.55	lv	
28-Oct-87	5000	54	1.45	lv	
28-Oct-87	5000	54		lv	
28-Oct-87	5000	55	1.50	lv	
28-Oct-87	5000	56	1.65	lv	
28-Oct-87	5000	57		lv	
28-Oct-87	5000	58	1.75	lv	
28-Oct-87	5000	60	2.05	lv	
28-Oct-87	5000	61	1.95	lv	
28-Oct-87	5000	61	1.90	lv	
28-Oct-87	5000	63	2.40	lv	
28-Oct-87	5000	64	2.55	lv	
28-Oct-87	5000	65		lv	
28-Oct-87	5000	65		lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	66	2.65	lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	67		lv	
28-Oct-87	5000	68		lv	
28-Oct-87	5000	70	3.10	lv	
28-Oct-87	5000	71		rv	
28-Oct-87	5000	71		rv	
28-Oct-87	5000	72		rv	
28-Oct-87	5000	72		rv	
28-Oct-87	5000	72		rv	
28-Oct-87	5000	73		rv	
28-Oct-87	5000	74		rv	
28-Oct-87	5000	74		rv	
28-Oct-87	5000	76	4.00	rv	
28-Oct-87	5000	76		rv	
28-Oct-87	5000	77		rv	
28-Oct-87	5000	77		rv	
28-Oct-87	5000	79	4.50	rv	
28-Oct-87	5000	82	5.15	rv	
28-Oct-87	5000	82		rv	
28-Oct-87	5000	84	5.65	rv	
28-Oct-87	5000	86	5.75	rv	
28-Oct-87	5000	90	7.20	rv	
28-Oct-87	5000	91	7.65	rv	
28-Oct-87	5000	91		rv	
28-Oct-87	5000	91		rv	
28-Oct-87	5000	92	7.85	rv	
28-Oct-87	5000	92		rv	
28-Oct-87	5000	93	8.00	rv	
28-Oct-87	5000	95	8.45	rv	
28-Oct-87	5000	95	8.30	rv	
28-Oct-87	5000	96	8.80	rv	
28-Oct-87	5000	97		rv	
28-Oct-87	5000	98	13.15	rv	
28-Oct-87	5000	98	9.80	rv	
28-Oct-87	5000	100	10.05	rv	
28-Oct-87	5000	100	9.20	rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	101		rv	
28-Oct-87	5000	103	11.35	rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	108	12.05	rv	
28-Oct-87	5000	108	12.95	rv	
28-Oct-87	5000	108		rv	
28-Oct-87	5000	108		rv	
28-Oct-87	5000	108		rv	
28-Oct-87	5000	110	13.20	rv	
28-Oct-87	5000	111	13.75	rv	
28-Oct-87	5000	112	11.10	rv	
28-Oct-87	5000	112		rv	
28-Oct-87	5000	115	14.75	rv	
28-Oct-87	5000	118	16.65	rv	
28-Oct-87	5000	118	16.10	rv	
28-Oct-87	5000	45		lv	
28-Oct-87	5000	45		lv	
28-Oct-87	5000	47		lv	
28-Oct-87	5000	48		lv	
28-Oct-87	5000	48		lv	
28-Oct-87	5000	53		lv	
28-Oct-87	5000	53		lv	
28-Oct-87	5000	57		lv	
28-Oct-87	5000	57		lv	
28-Oct-87	5000	57		lv	
28-Oct-87	5000	58		lv	
28-Oct-87	5000	58		lv	
28-Oct-87	5000	59		lv	
28-Oct-87	5000	59		lv	
28-Oct-87	5000	59		lv	
28-Oct-87	5000	60		lv	
28-Oct-87	5000	60		lv	
28-Oct-87	5000	61		lv	
28-Oct-87	5000	61		lv	
28-Oct-87	5000	62		lv	
28-Oct-87	5000	63		lv	
28-Oct-87	5000	62		lv	
28-Oct-87	5000	64		lv	
28-Oct-87	5000	64		lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	65		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	66		lv	
28-Oct-87	5000	67		lv	
28-Oct-87	5000	67		lv	
28-Oct-87	5000	67		lv	
28-Oct-87	5000	67		lv	
28-Oct-87	5000	68		lv	
28-Oct-87	5000	68		lv	
28-Oct-87	5000	68		lv	
28-Oct-87	5000	68		lv	
28-Oct-87	5000	68		lv	
28-Oct-87	5000	69		lv	
28-Oct-87	5000	69		lv	
28-Oct-87	5000	69		lv	
28-Oct-87	5000	69		lv	
28-Oct-87	5000	69		lv	
28-Oct-87	5000	69		lv	
28-Oct-87	5000	70		lv	
28-Oct-87	5000	70		lv	
28-Oct-87	5000	70		lv	
28-Oct-87	5000	70		lv	
28-Oct-87	5000	71		rv	
28-Oct-87	5000	72		rv	
28-Oct-87	5000	72		rv	
28-Oct-87	5000	72		rv	
28-Oct-87	5000	73		rv	
28-Oct-87	5000	73		rv	
28-Oct-87	5000	73		rv	
28-Oct-87	5000	74		rv	
28-Oct-87	5000	74		rv	
28-Oct-87	5000	74		rv	
28-Oct-87	5000	74		rv	
28-Oct-87	5000	75		rv	
28-Oct-87	5000	75		rv	
28-Oct-87	5000	75		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	76		rv	
28-Oct-87	5000	76		rv	
28-Oct-87	5000	76		rv	
28-Oct-87	5000	76		rv	
28-Oct-87	5000	76		rv	
28-Oct-87	5000	77		rv	
28-Oct-87	5000	78		rv	
28-Oct-87	5000	79		rv	
28-Oct-87	5000	79		rv	
28-Oct-87	5000	80		rv	
28-Oct-87	5000	80		rv	
28-Oct-87	5000	81		rv	
28-Oct-87	5000	81		rv	
28-Oct-87	5000	82		rv	
28-Oct-87	5000	82		rv	
28-Oct-87	5000	82		rv	
28-Oct-87	5000	82		rv	
28-Oct-87	5000	83		rv	
28-Oct-87	5000	84		rv	
28-Oct-87	5000	85		rv	
28-Oct-87	5000	87		rv	
28-Oct-87	5000	89		rv	
28-Oct-87	5000	89		rv	
28-Oct-87	5000	89		rv	
28-Oct-87	5000	90		rv	
28-Oct-87	5000	90		rv	
28-Oct-87	5000	92		rv	
28-Oct-87	5000	93		rv	
28-Oct-87	5000	94		rv	
28-Oct-87	5000	95		rv	
28-Oct-87	5000	97		rv	
28-Oct-87	5000	97		rv	
28-Oct-87	5000	97		rv	
28-Oct-87	5000	98		rv	
28-Oct-87	5000	98		rv	
28-Oct-87	5000	98		rv	
28-Oct-87	5000	99		rv	
28-Oct-87	5000	99		rv	
28-Oct-87	5000	99		rv	
28-Oct-87	5000	100		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	100		rv	
28-Oct-87	5000	101		rv	
28-Oct-87	5000	102		rv	
28-Oct-87	5000	102		rv	
28-Oct-87	5000	102		rv	
28-Oct-87	5000	102		rv	
28-Oct-87	5000	103		rv	
28-Oct-87	5000	103		rv	
28-Oct-87	5000	103		rv	
28-Oct-87	5000	103		rv	
28-Oct-87	5000	104		rv	
28-Oct-87	5000	104		rv	
28-Oct-87	5000	104		rv	
28-Oct-87	5000	104		rv	
28-Oct-87	5000	105		rv	
28-Oct-87	5000	105		rv	
28-Oct-87	5000	105		rv	
28-Oct-87	5000	105		rv	
28-Oct-87	5000	106		rv	
28-Oct-87	5000	106		rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	107		rv	
28-Oct-87	5000	108		rv	
28-Oct-87	5000	108		rv	
28-Oct-87	5000	108		rv	
28-Oct-87	5000	109		rv	
28-Oct-87	5000	109		rv	
28-Oct-87	5000	110		rv	
28-Oct-87	5000	111		rv	
28-Oct-87	5000	111		rv	
28-Oct-87	5000	111		rv	
28-Oct-87	5000	112		rv	
28-Oct-87	5000	112		rv	
28-Oct-87	5000	113		rv	
28-Oct-87	5000	113		rv	
28-Oct-87	5000	114		rv	
28-Oct-87	5000	114		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
28-Oct-87	5000	114		rv	
28-Oct-87	5000	115		rv	
28-Oct-87	5000	115		rv	
28-Oct-87	5000	117		rv	
28-Oct-87	5000	119		rv	
10-Nov-87	7000	43	0.65	lv	
10-Nov-87	7000	43	0.60	lv	
10-Nov-87	7000	43		lv	
10-Nov-87	7000	44	0.85	lv	
10-Nov-87	7000	44	0.80	lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	45	0.90	lv	
10-Nov-87	7000	45	0.80	lv	
10-Nov-87	7000	45		lv	
10-Nov-87	7000	46	0.95	lv	
10-Nov-87	7000	46	0.80	lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	47	0.95	lv	
10-Nov-87	7000	47	1.00	lv	
10-Nov-87	7000	48	0.90	lv	
10-Nov-87	7000	48	1.00	lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	49	1.05	lv	
10-Nov-87	7000	49	1.10	lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	50	1.10	lv	
10-Nov-87	7000	50	1.20	lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	51	1.30	lv	
10-Nov-87	7000	51	1.15	lv	
10-Nov-87	7000	52	1.30	lv	
10-Nov-87	7000	52	1.25	lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	53	1.40	lv	
10-Nov-87	7000	53	1.40	lv	
10-Nov-87	7000	53	1.30	lv	
10-Nov-87	7000	53		lv	
10-Nov-87	7000	54	1.35	lv	
10-Nov-87	7000	54	1.55	lv	
10-Nov-87	7000	55	1.45	lv	
10-Nov-87	7000	56	1.55	lv	
10-Nov-87	7000	57	1.55	lv	
10-Nov-87	7000	57	1.70	lv	
10-Nov-87	7000	60	2.20	lv	
10-Nov-87	7000	62	2.00	lv	
10-Nov-87	7000	66	2.65	lv	
10-Nov-87	7000	71	3.60	rv	
10-Nov-87	7000	73	3.65	rv	
10-Nov-87	7000	74	3.85	rv	
10-Nov-87	7000	74	4.00	rv	
10-Nov-87	7000	77	5.80	rv	
10-Nov-87	7000	79	4.70	rv	
10-Nov-87	7000	79	4.80	rv	
10-Nov-87	7000	79	4.65	rv	
10-Nov-87	7000	80	4.95	rv	
10-Nov-87	7000	81	5.20	rv	
10-Nov-87	7000	82	5.20	rv	
10-Nov-87	7000	85	6.10	rv	
10-Nov-87	7000	86	6.00	rv	
10-Nov-87	7000	86	5.95	rv	
10-Nov-87	7000	87	6.35	rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
10-Nov-87	7000	88	7.00	rv	
10-Nov-87	7000	89	7.25	rv	
10-Nov-87	7000	89	6.25	rv	
10-Nov-87	7000	90	7.10	rv	
10-Nov-87	7000	92	7.80	rv	
10-Nov-87	7000	94	8.45	rv	
10-Nov-87	7000	96	8.05	rv	
10-Nov-87	7000	96	8.55	rv	
10-Nov-87	7000	103	10.45	rv	
10-Nov-87	7000	107	11.35	rv	
10-Nov-87	7000	43		lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	44		lv	
10-Nov-87	7000	45		lv	
10-Nov-87	7000	45		lv	
10-Nov-87	7000	45		lv	
10-Nov-87	7000	45		lv	
10-Nov-87	7000	45		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	46		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	47		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	48		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	49		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	50		lv	
10-Nov-87	7000	51		lv	
10-Nov-87	7000	51		lv	
10-Nov-87	7000	51		lv	
10-Nov-87	7000	51		lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
10-Nov-87	7000	51		lv	
10-Nov-87	7000	51		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	52		lv	
10-Nov-87	7000	53		lv	
10-Nov-87	7000	53		lv	
10-Nov-87	7000	53		lv	
10-Nov-87	7000	53		lv	
10-Nov-87	7000	53		lv	
10-Nov-87	7000	53		lv	
10-Nov-87	7000	54		lv	
10-Nov-87	7000	54		lv	
10-Nov-87	7000	54		lv	
10-Nov-87	7000	54		lv	
10-Nov-87	7000	54		lv	
10-Nov-87	7000	54		lv	
10-Nov-87	7000	54		lv	
10-Nov-87	7000	55	1.55	lv	
10-Nov-87	7000	55		lv	
10-Nov-87	7000	55		lv	
10-Nov-87	7000	55		lv	
10-Nov-87	7000	55		lv	
10-Nov-87	7000	55		lv	
10-Nov-87	7000	56	1.80	lv	
10-Nov-87	7000	56		lv	
10-Nov-87	7000	56		lv	
10-Nov-87	7000	57	1.65	lv	
10-Nov-87	7000	57	1.65	lv	
10-Nov-87	7000	57		lv	
10-Nov-87	7000	57		lv	
10-Nov-87	7000	58	2.00	lv	
10-Nov-87	7000	59	1.75	lv	
10-Nov-87	7000	59	1.85	lv	
10-Nov-87	7000	60	2.00	lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
10-Nov-87	7000	60	2.05	lv	
10-Nov-87	7000	60		lv	
10-Nov-87	7000	60		lv	
10-Nov-87	7000	60		lv	
10-Nov-87	7000	61	2.10	lv	
10-Nov-87	7000	62	2.35	lv	
10-Nov-87	7000	62	2.50	lv	
10-Nov-87	7000	63	2.65	lv	
10-Nov-87	7000	65	2.50	lv	
10-Nov-87	7000	65	2.50	lv	
10-Nov-87	7000	65		lv	
10-Nov-87	7000	66	2.70	lv	
10-Nov-87	7000	66	2.65	lv	
10-Nov-87	7000	69	3.15	lv	
10-Nov-87	7000	70	3.40	lv	
10-Nov-87	7000	74	3.95	rv	
10-Nov-87	7000	76	4.10	rv	
10-Nov-87	7000	77	4.65	rv	
10-Nov-87	7000	77	4.45	rv	
10-Nov-87	7000	78	4.60	rv	
10-Nov-87	7000	78	4.40	rv	
10-Nov-87	7000	78		rv	
10-Nov-87	7000	79	4.40	rv	
10-Nov-87	7000	80	5.15	rv	
10-Nov-87	7000	80	5.40	rv	
10-Nov-87	7000	80		rv	
10-Nov-87	7000	80		rv	
10-Nov-87	7000	80		rv	
10-Nov-87	7000	81	4.80	rv	
10-Nov-87	7000	82	5.65	rv	
10-Nov-87	7000	82		rv	
10-Nov-87	7000	82		rv	
10-Nov-87	7000	82		rv	
10-Nov-87	7000	82		rv	
10-Nov-87	7000	82		rv	
10-Nov-87	7000	83	5.50	rv	
10-Nov-87	7000	83	5.20	rv	
10-Nov-87	7000	83		rv	
10-Nov-87	7000	84	5.30	rv	
10-Nov-87	7000	84		rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
10-Nov-87	7000	84		rv	
10-Nov-87	7000	85	6.00	rv	
10-Nov-87	7000	85	5.90	rv	
10-Nov-87	7000	85	5.90	rv	
10-Nov-87	7000	85		rv	
10-Nov-87	7000	85		rv	
10-Nov-87	7000	85		rv	
10-Nov-87	7000	85		rv	
10-Nov-87	7000	85		rv	
10-Nov-87	7000	86	6.60	rv	
10-Nov-87	7000	86	6.15	rv	
10-Nov-87	7000	86		rv	
10-Nov-87	7000	86		rv	
10-Nov-87	7000	87	7.25	rv	
10-Nov-87	7000	87	6.25	rv	
10-Nov-87	7000	88	6.40	rv	
10-Nov-87	7000	88	6.35	rv	
10-Nov-87	7000	88		rv	
10-Nov-87	7000	89		rv	
10-Nov-87	7000	90	6.55	rv	
10-Nov-87	7000	90	7.00	rv	
10-Nov-87	7000	90		rv	
10-Nov-87	7000	91	7.10	rv	
10-Nov-87	7000	91		rv	
10-Nov-87	7000	91		rv	
10-Nov-87	7000	92	7.20	rv	
10-Nov-87	7000	92	7.55	rv	
10-Nov-87	7000	92		rv	
10-Nov-87	7000	93	7.85	rv	
10-Nov-87	7000	94	7.90	rv	
10-Nov-87	7000	95	8.00	rv	
10-Nov-87	7000	96	8.75	rv	
10-Nov-87	7000	97	9.10	rv	
10-Nov-87	7000	98	9.60	rv	
10-Nov-87	7000	98	10.00	rv	
10-Nov-87	7000	100	9.90	rv	
10-Nov-87	7000	101		rv	
10-Nov-87	7000	102	10.25	rv	
10-Nov-87	7000	102	10.75	rv	
10-Nov-87	7000	111	12.60	rv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
10-Nov-87	7000	112	12.90	rv	mark run
04-Nov-87	8000	68		rv or lv	
04-Nov-87	8000	70		rv or lv	
04-Nov-87	8000	70		rv or lv	
04-Nov-87	8000	71		rv or lv	
04-Nov-87	8000	72		rv or lv	
04-Nov-87	8000	72		rv or lv	
04-Nov-87	8000	72		rv or lv	
04-Nov-87	8000	73		rv or lv	
04-Nov-87	8000	73		rv or lv	
04-Nov-87	8000	74		rv or lv	
04-Nov-87	8000	75		rv or lv	
04-Nov-87	8000	75		rv or lv	
04-Nov-87	8000	75		rv or lv	
04-Nov-87	8000	76		rv or lv	
04-Nov-87	8000	78		rv or lv	
04-Nov-87	8000	78		rv or lv	
04-Nov-87	8000	79		rv or lv	
04-Nov-87	8000	79		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	81		rv or lv	
04-Nov-87	8000	82		rv or lv	
04-Nov-87	8000	82		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	85		rv or lv	
04-Nov-87	8000	85		rv or lv	
04-Nov-87	8000	86		rv or lv	
04-Nov-87	8000	87		rv or lv	
04-Nov-87	8000	87		rv or lv	
04-Nov-87	8000	88		rv or lv	
04-Nov-87	8000	89		rv or lv	
04-Nov-87	8000	93		rv or lv	
04-Nov-87	8000	94		rv or lv	
04-Nov-87	8000	95		rv or lv	
04-Nov-87	8000	95		rv or lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
04-Nov-87	8000	96		rv or lv	
04-Nov-87	8000	96		rv or lv	
04-Nov-87	8000	97		rv or lv	
04-Nov-87	8000	100		rv or lv	
04-Nov-87	8000	100		rv or lv	
04-Nov-87	8000	100		rv or lv	
04-Nov-87	8000	101		rv or lv	
04-Nov-87	8000	104		rv or lv	
04-Nov-87	8000	105		rv or lv	
04-Nov-87	8000	106		rv or lv	
04-Nov-87	8000	107		rv or lv	
04-Nov-87	8000	108		rv or lv	
04-Nov-87	8000	108		rv or lv	
04-Nov-87	8000	109		rv or lv	
04-Nov-87	8000	110		rv or lv	
04-Nov-87	8000	110		rv or lv	
04-Nov-87	8000	110		rv or lv	
04-Nov-87	8000	110		rv or lv	
04-Nov-87	8000	113		rv or lv	
04-Nov-87	8000	113		rv or lv	
04-Nov-87	8000	113		rv or lv	
04-Nov-87	8000	114		rv or lv	
04-Nov-87	8000	114		rv or lv	
04-Nov-87	8000	115		rv or lv	
04-Nov-87	8000	115		rv or lv	
04-Nov-87	8000	115		rv or lv	
04-Nov-87	8000	118		rv or lv	
04-Nov-87	8000	118		rv or lv	
04-Nov-87	8000	118		rv or lv	
04-Nov-87	8000	119		rv or lv	
04-Nov-87	8000	120		rv or lv	
04-Nov-87	8000	120		rv or lv	
04-Nov-87	8000	122		rv or lv	
04-Nov-87	8000	123		rv or lv	
04-Nov-87	8000	129		rv or lv	
04-Nov-87	8000	81		rv or lv	
04-Nov-87	8000	82		rv or lv	
04-Nov-87	8000	83		rv or lv	
04-Nov-87	8000	83		rv or lv	
04-Nov-87	8000	83		rv or lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	85		rv or lv	
04-Nov-87	8000	85		rv or lv	
04-Nov-87	8000	85		rv or lv	
04-Nov-87	8000	85		rv or lv	
04-Nov-87	8000	86		rv or lv	
04-Nov-87	8000	86		rv or lv	
04-Nov-87	8000	86		rv or lv	
04-Nov-87	8000	87		rv or lv	
04-Nov-87	8000	87		rv or lv	
04-Nov-87	8000	87		rv or lv	
04-Nov-87	8000	88		rv or lv	
04-Nov-87	8000	89		rv or lv	
04-Nov-87	8000	89		rv or lv	
04-Nov-87	8000	89		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	91		rv or lv	
04-Nov-87	8000	91		rv or lv	
04-Nov-87	8000	91		rv or lv	
04-Nov-87	8000	92		rv or lv	
04-Nov-87	8000	93		rv or lv	
04-Nov-87	8000	93		rv or lv	
04-Nov-87	8000	93		rv or lv	
04-Nov-87	8000	93		rv or lv	
04-Nov-87	8000	94		rv or lv	
04-Nov-87	8000	94		rv or lv	
04-Nov-87	8000	96		rv or lv	
04-Nov-87	8000	97		rv or lv	
04-Nov-87	8000	97		rv or lv	
04-Nov-87	8000	98		rv or lv	
04-Nov-87	8000	99		rv or lv	
04-Nov-87	8000	102		rv or lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
04-Nov-87	8000	102		rv or lv	
04-Nov-87	8000	102		rv or lv	
04-Nov-87	8000	103		rv or lv	
04-Nov-87	8000	104		rv or lv	
04-Nov-87	8000	104		rv or lv	
04-Nov-87	8000	105		rv or lv	
04-Nov-87	8000	105		rv or lv	
04-Nov-87	8000	106		rv or lv	
04-Nov-87	8000	107		rv or lv	
04-Nov-87	8000	107		rv or lv	
04-Nov-87	8000	107		rv or lv	
04-Nov-87	8000	107		rv or lv	
04-Nov-87	8000	107		rv or lv	
04-Nov-87	8000	108		rv or lv	
04-Nov-87	8000	108		rv or lv	
04-Nov-87	8000	110		rv or lv	
04-Nov-87	8000	111		rv or lv	
04-Nov-87	8000	112		rv or lv	
04-Nov-87	8000	113		rv or lv	
04-Nov-87	8000	114		rv or lv	
04-Nov-87	8000	114		rv or lv	
04-Nov-87	8000	114		rv or lv	
04-Nov-87	8000	115		rv or lv	
04-Nov-87	8000	116		rv or lv	
04-Nov-87	8000	117		rv or lv	
04-Nov-87	8000	118		rv or lv	
04-Nov-87	8000	118		rv or lv	
04-Nov-87	8000	118		rv or lv	
04-Nov-87	8000	118		rv or lv	
04-Nov-87	8000	119		rv or lv	
04-Nov-87	8000	120		rv or lv	
04-Nov-87	8000	120		rv or lv	
04-Nov-87	8000	120		rv or lv	
04-Nov-87	8000	127		rv or lv	
04-Nov-87	8000	127		rv or lv	
04-Nov-87	8000	127		rv or lv	
04-Nov-87	8000	61		rv or lv	
04-Nov-87	8000	74		rv or lv	
04-Nov-87	8000	74		rv or lv	
04-Nov-87	8000	75		rv or lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
04-Nov-87	8000	76		rv or lv	
04-Nov-87	8000	76		rv or lv	
04-Nov-87	8000	76		rv or lv	
04-Nov-87	8000	78		rv or lv	
04-Nov-87	8000	78		rv or lv	
04-Nov-87	8000	79		rv or lv	
04-Nov-87	8000	79		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	80		rv or lv	
04-Nov-87	8000	82		rv or lv	
04-Nov-87	8000	82		rv or lv	
04-Nov-87	8000	82		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	88		rv or lv	
04-Nov-87	8000	88		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	92		rv or lv	
04-Nov-87	8000	73		rv or lv	
04-Nov-87	8000	75		rv or lv	
04-Nov-87	8000	76		rv or lv	
04-Nov-87	8000	82		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	84		rv or lv	
04-Nov-87	8000	86		rv or lv	
04-Nov-87	8000	87		rv or lv	
04-Nov-87	8000	88		rv or lv	
04-Nov-87	8000	88		rv or lv	
04-Nov-87	8000	90		rv or lv	
04-Nov-87	8000	91		rv or lv	
04-Nov-87	8000	94		rv or lv	
04-Nov-87	8000	95		rv or lv	
04-Nov-87	8000	96		rv or lv	
04-Nov-87	8000	102		rv or lv	
04-Nov-87	8000	103		rv or lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
04-Nov-87	8000	106		rv or lv	
04-Nov-87	8000	109		rv or lv	
04-Nov-87	8000	110		rv or lv	
04-Nov-87	8000	91		rv or lv	
04-Nov-87	8000	92		rv or lv	
04-Nov-87	8000	92		rv or lv	
04-Nov-87	8000	116		rv or lv	
04-Nov-87	8000	121		rv or lv	
05-Nov-87	8000	84		rv or lv	
05-Nov-87	8000	91		rv or lv	
05-Nov-87	8000	106		rv or lv	
05-Nov-87	8000	108		rv or lv	
06-Nov-87	8000	81	5.00	rv or lv	
06-Nov-87	8000	83	5.50	rv or lv	
06-Nov-87	8000	85	6.40	rv or lv	
06-Nov-87	8000	85	5.70	rv or lv	
06-Nov-87	8000	87	6.20	rv or lv	
06-Nov-87	8000	87	6.25	rv or lv	
06-Nov-87	8000	87		rv or lv	
06-Nov-87	8000	87		rv or lv	
06-Nov-87	8000	88	6.60	rv or lv	
06-Nov-87	8000	91	7.35	rv or lv	
06-Nov-87	8000	91	7.05	rv or lv	
06-Nov-87	8000	97	9.90	rv or lv	
06-Nov-87	8000	97	8.00	rv or lv	
06-Nov-87	8000	98	6.35	rv or lv	
06-Nov-87	8000	98	9.55	rv or lv	
06-Nov-87	8000	99	9.00	rv or lv	
06-Nov-87	8000	102	10.95	rv or lv	
06-Nov-87	8000	103	10.60	rv or lv	
06-Nov-87	8000	103	11.85	rv or lv	
06-Nov-87	8000	104	11.30	rv or lv	
06-Nov-87	8000	105	11.85	rv or lv	
06-Nov-87	8000	107	11.40	rv or lv	
06-Nov-87	8000	109	13.70	rv or lv	
06-Nov-87	8000	114	15.40	rv or lv	
06-Nov-87	8000	117	16.85	rv or lv	
06-Nov-87	8000	119	18.05	rv or lv	
06-Nov-87	8000	120	17.40	rv or lv	
06-Nov-87	8000	121	16.75	rv or lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
06-Nov-87	8000	122	19.20	rv or lv	
06-Nov-87	8000	128	22.70	rv or lv	
06-Nov-87	8000	65	2.80	rv or lv	
06-Nov-87	8000	67	2.90	rv or lv	
06-Nov-87	8000	73	3.55	rv or lv	
06-Nov-87	8000	73	3.55	rv or lv	
06-Nov-87	8000	73		rv or lv	
06-Nov-87	8000	77	4.40	rv or lv	
06-Nov-87	8000	81	5.15	rv or lv	
06-Nov-87	8000	82	5.55	rv or lv	
06-Nov-87	8000	82	5.10	rv or lv	
06-Nov-87	8000	83	5.30	rv or lv	
06-Nov-87	8000	84	6.00	rv or lv	
06-Nov-87	8000	90	7.20	rv or lv	
12-Nov-87	8000	78	4.35	rv or lv	
12-Nov-87	8000	85	6.25	rv or lv	
12-Nov-87	8000	87	6.50	rv or lv	
12-Nov-87	8000	87	6.20	rv or lv	
12-Nov-87	8000	90	7.45	rv or lv	
12-Nov-87	8000	90	7.40	rv or lv	
12-Nov-87	8000	91	8.10	rv or lv	
12-Nov-87	8000	91	7.40	rv or lv	
12-Nov-87	8000	93	8.15	rv or lv	
12-Nov-87	8000	95	9.25	rv or lv	
12-Nov-87	8000	96	8.40	rv or lv	
12-Nov-87	8000	101	9.90	rv or lv	
12-Nov-87	8000	107	11.50	rv or lv	
12-Nov-87	8000	110	12.80	rv or lv	
12-Nov-87	8000	110	12.45	rv or lv	
12-Nov-87	8000	110		rv or lv	
12-Nov-87	8000	111	14.25	rv or lv	
12-Nov-87	8000	112	14.10	rv or lv	
12-Nov-87	8000	65	2.50	rv or lv	
12-Nov-87	8000	68	2.95	rv or lv	
12-Nov-87	8000	71	3.35	rv or lv	
12-Nov-87	8000	72	3.70	rv or lv	
12-Nov-87	8000	73	3.60	rv or lv	
12-Nov-87	8000	76	4.15	rv or lv	
12-Nov-87	8000	78	4.55	rv or lv	
12-Nov-87	8000	80	5.25	rv or lv	

Table 1. (Cont'd)

Date	Site	Length (mm)	Weight (g)	Mark	Comment
12-Nov-87	8000	81	4.80	rv or lv	
12-Nov-87	8000	81	5.00	rv or lv	
12-Nov-87	8000	79	5.00	rv or lv	
12-Nov-87	8000	89	7.00	rv or lv	
12-Nov-87	8000	90	7.50	rv or lv	
12-Nov-87	8000	95	8.45	rv or lv	
12-Nov-87	8000	101	10.05	rv or lv	
12-Nov-87	8000	104	15.85	rv or lv	
12-Nov-87	8000	108	12.50	rv or lv	
12-Nov-87	8000	114	15.55	rv or lv	
12-Nov-87	8000	66	2.70	rv or lv	
12-Nov-87	8000	68	3.00	rv or lv	
12-Nov-87	8000	69	2.90	rv or lv	
12-Nov-87	8000	76	4.15	rv or lv	
12-Nov-87	8000	80	4.70	rv or lv	
12-Nov-87	8000	83	5.05	rv or lv	
12-Nov-87	8000	90	6.95	rv or lv	
12-Nov-87	8000	91	6.90	rv or lv	
12-Nov-87	8000	102	9.70	rv or lv	
12-Nov-87	8000	103	10.40	rv or lv	
12-Nov-87	8000	106	12.80	rv or lv	
12-Nov-87	8000	114	14.90	rv or lv	
12-Nov-87	8000	119	16.70	rv or lv	
12-Nov-87	8000	120	17.65	rv or lv	
12-Nov-87	8000	126	21.25	rv or lv	
12-Nov-87	8000	66	2.60	rv or lv	
12-Nov-87	8000	73	3.75	rv or lv	
12-Nov-87	8000	74	3.95	rv or lv	
12-Nov-87	8000	77	4.20	rv or lv	
12-Nov-87	8000	81	5.30	rv or lv	
12-Nov-87	8000	83	5.60	rv or lv	

Marks:
V brand = V shaped cold brand
rv = right ventral fin clip
lv = left ventral fin clip
rv or lv = either a right or left ventral fin clip

Table 2. Summary of fall 1987 Lachmach River juvenile coho sampling.

Site	No. of Length Samples	Average Length (mm)	Length Range (mm)	No. of Weight Samples	Average Weight (g)	Weight Range (g)
393	5	60.0	50 - 78	5	2.30	1.30 - 4.70
570	19	62.0	50 - 77	19	2.46	1.05 - 4.65
2000	9	61.8	51 - 84	9	2.53	1.25 - 5.95
3390	313	58.6	42 - 95	26	2.28	1.00 - 5.85
5000	299	83.4	45 - 128	99	6.81	0.85 - 20.00
7000	276	62.8	43 - 112	116	4.46	0.60 - 12.90
8000	310	93.7	61 - 129	95	8.42	2.50 - 22.70

Table 3. Summary of juvenile coho population estimates, Lachmach River fall 1987.

Site	Population Estimate		Site Wetted Area (m^2)	Density (fish/m^2)	
	Age 0+	Age 1+		Age 0+	Age 1+
393[a]			59.3		
570	33 (17 - 97)	3[b]	309.08	0.11 (0.05 - 0.31)	0.01
2000[c]			25		
3390[d]	69 (48 - 106)	8 (7 - 14)	66	1.04 (0.72 - 1.61)	0.12 (0.11 - 0.21)
3390[e]	4440 (3836 - 5164)	1227 (946 - 1668)	3472	1.28 (1.10 - 1.49)	0.35 (0.27 - 0.48)
3820	9535 (8069 - 11297)	7248 (4664 - 11899)	3345	2.85 (2.41 - 3.38)	2.17 (1.39 - 3.56)
5000	1305 (1128 - 1525)	1491 (1225 - 1837)	15270	0.08 (0.07 - 0.01)	0.10 (0.08 - 0.12)
7000	2726 (1744 - 4562)	596 (373 - 1076)	1810	1.51 (0.96 - 2.52)	0.33 (0.21 - 0.59)
8000	134 (90 - 234)	213 (168 - 292)	305.25	0.44 (0.29 - 0.77)	0.70 (0.55 - 0.96)

Numbers in brackets are the 95% confidence intervals

[a]No estimate - 5 coho total captured in 2 passes

[b]No Age 1+ estimate - 0 large coho captured on pass 2

[c]No estimate - pass 2 could not be conducted due to bear - 9 coho total captured

[d]Sample using pole seine along stream margin

[e]Sample using Gee improved minnow traps

Table 4. Juvenile coho population estimation methods and results, Lachmach River fall 1987.

Site	Capture Method	Estimation Method	No. 0+ Age Coho		0+ Population Estimate	No. 1+ Age Coho		1+ Population Estimate
			Pass 1	Pass 2		Pass 1	Pass 2	
393	pole seine	2 pass removal	4			1		
570	pole seine	2 pass removal	10	7	33	3	0	3
2000	pole seine	2 pass removal	7			2		
3390	pole seine	2 pass removal	31	17	69	5	2	8

Site	Estimation Method	No. of Gee Traps Used	No. Marked		Recapture				Population Estimate	
			Age 0+	Age 1+	Age 0+		Age 1+		Age 0+	Age 1+
					unmarked	marked	unmarked	marked		
3390	mark recapture	45	807	240	517	114	135	32	4440	1227
3820	mark recapture	45	856	271	1124	110	436	16	9535	7248
5000	mark recapture	45	421	363	159	75	161	51	1305	1491
7000	mark recapture	45	191	79	198	14	71	10	2726	596
8000	mark recapture	45	26	48	22	8	35	20	134	213

Table 5. Number of marked and unmarked coho recovered by trap location at site 3820, Lachmach River fall 1987.

Trap Numbers	Number of unmarked large coho	Number of marked large coho	Number of unmarked small coho	Number of marked small coho
1,2,3	26	0	94	0
4,5,6	47	0	41	0
7,8,9	22	0	51	7
10,11,12	41	1	101	1
13,14,15	41	0	110	8
16,17,18	14	3	47	4
19,20,21	17	2	59	41
22,23,24	40	7	84	18
25,26,27	27	1	68	10
28,29,30	10	1	77	6
31,32,33	8	0	52	7
34,35,36	25	1	90	5
37,38,39	53	0	45	1
40,41,42	16	0	74	2
43,44,45	36	0	85	0

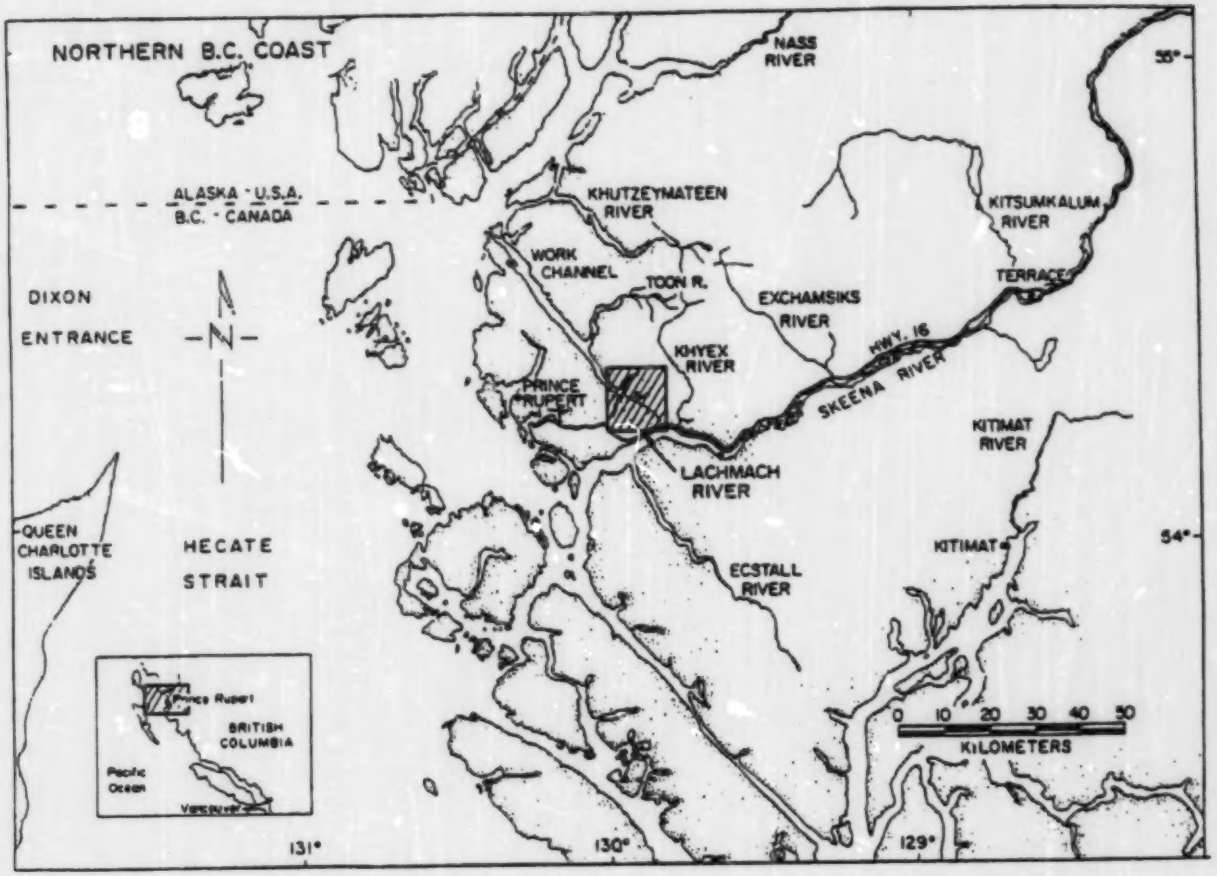

Figure 1. Lachmach River general area.

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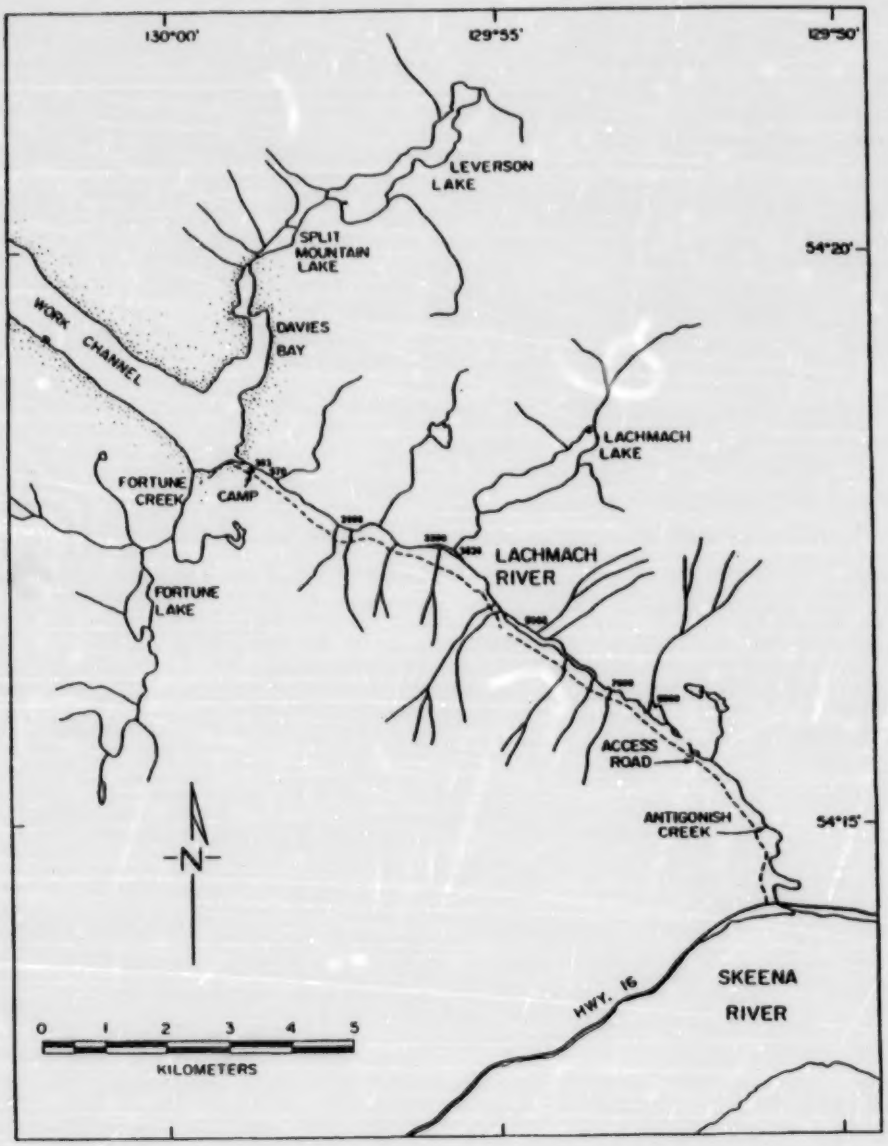

Figure 2. Map of the Lachmach River showing locations of study sites and adjacent systems.

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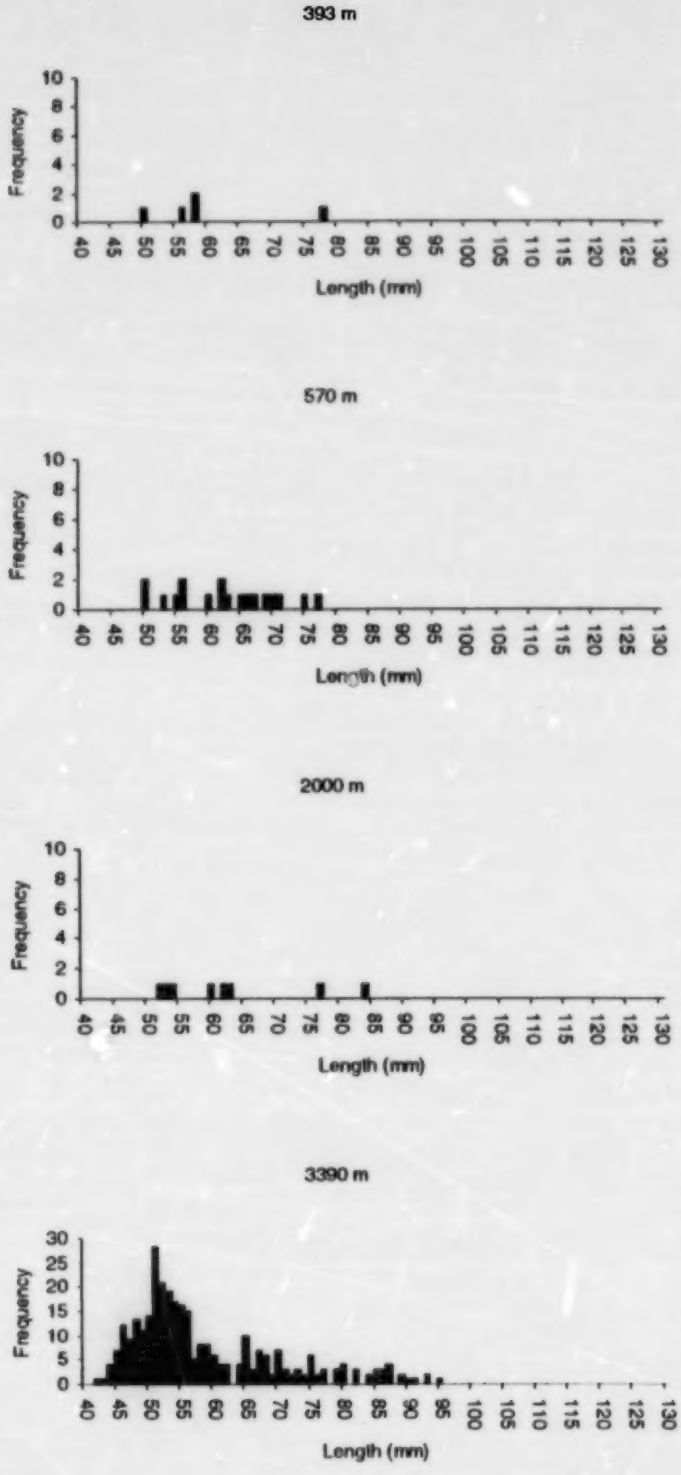

Figure 3. Length frequencies of juvenile coho sampled in the Lachmach River, fall 1987.

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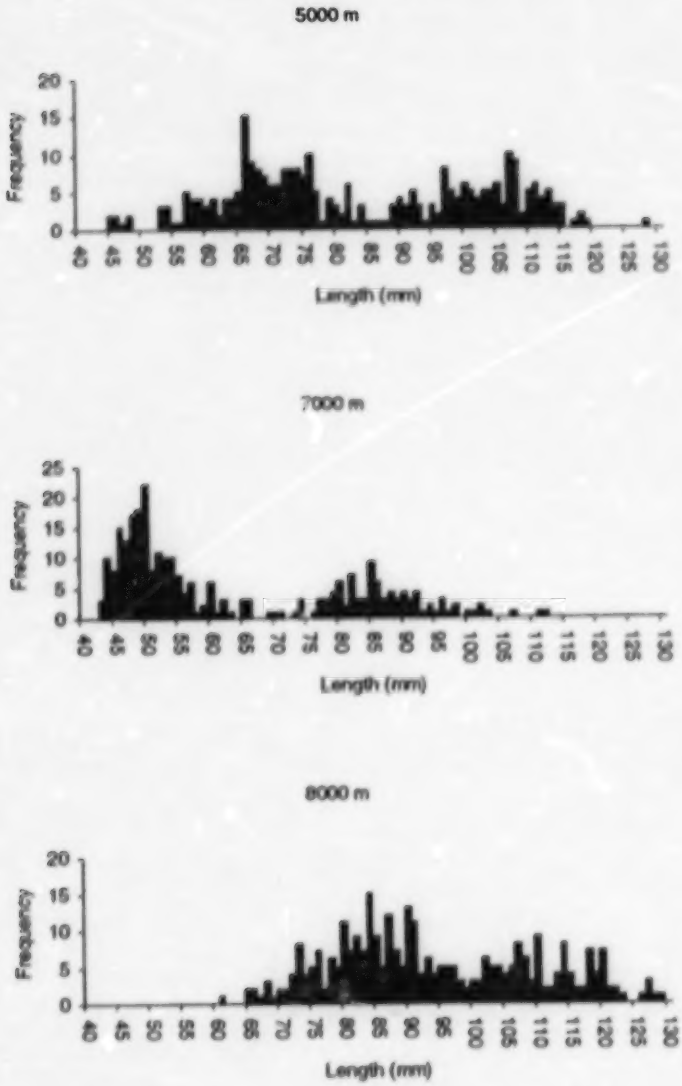

Figure 3. (con't)

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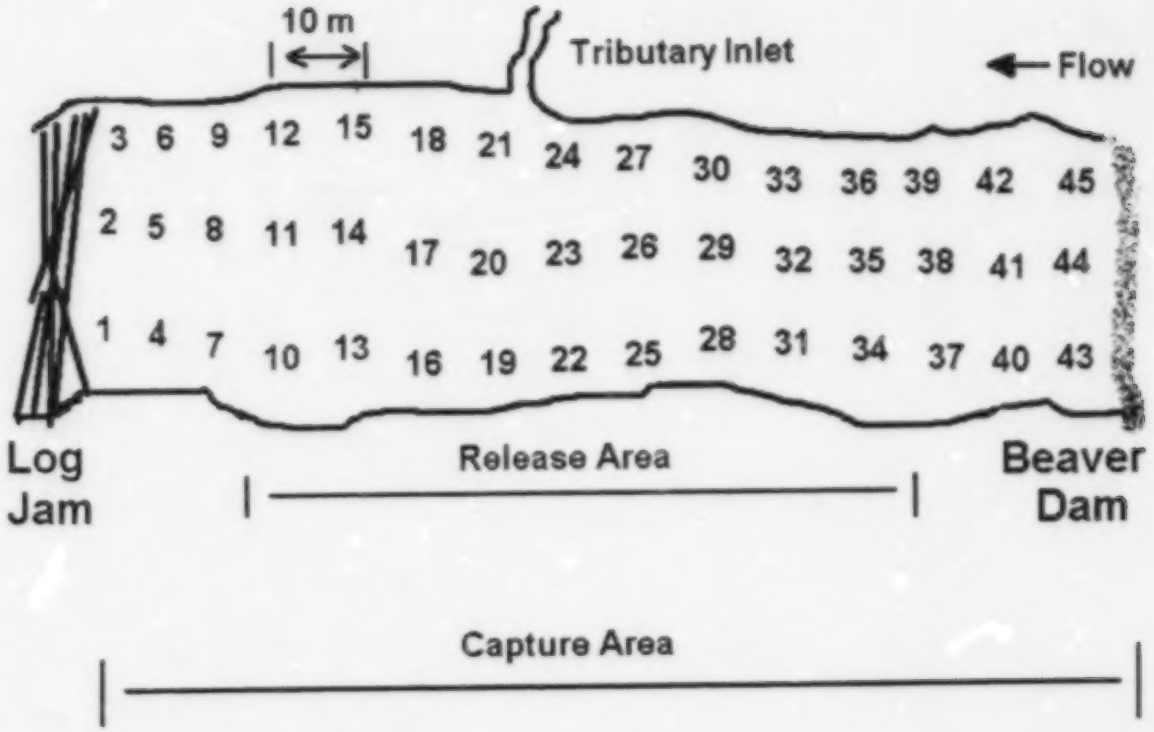

Figure 4. Site map of the Lachmach River 3820 site showing trap distribution and release and capture areas.